

ORIGINAL



0000077002

BEFORE THE ARIZONA CORPORATION COMMISSION

RECEIVED

47

COMMISSIONERS

MIKE GLEASON, Chairman

WILLIAM A. MUNDELL

JEFF HATCH-MILLER

KRISTIN K. MAYES

GARY PIERCE

2007 SEP 18 A 11: 10

AZ CORP COMMISSION
DOCKET CONTROL

Arizona Corporation Commission

DOCKETED

SEP 18 2007

DOCKETED BY

nr

IN THE MATTER OF THE APPLICATION
OF ARIZONA PUBLIC SERVICE
COMPANY FOR APPROVAL OF
RENEWABLE ENERGY STANDARD
IMPLEMENTATION PLAN, DISTRIBUTED
ENERGY ADMINISTRATION PLAN,
CUSTOMER SELF-DIRECT RENEWABLE
RESOURCE TARIFF, AND RESET OF
RENEWABLE ENERGY ADJUSTOR.

Docket No. E-01345A-07-0468

**Initial Comments of Western
Resource Advocates and the
Interwest Energy Alliance**

On August 7, 2007, Arizona Public Service Company (APS) filed its 2007 Renewable Energy Standard (RES) implementation plan pursuant to A.A.C. R14-2-1813. On August 30, 2007, APS filed an amended plan. Western Resource Advocates (WRA) and the Interwest Energy Alliance hereby file their initial comments on APS' plan, as amended. We may file additional comments at a later date.

These comments address only the acquisition of resources to meet the non-distributed portion of APS' RES requirements over the period 2008 to 2012. Other parties are expected to comment on distributed resources.

Our comments provide an independent assessment of APS' plan, and some of our assumptions differ from those inherent in APS' plan. We relied only on public sources of information such as APS' most recent Environmental Portfolio Standard filing in Docket No. E-01345A-95-0491, APS' FERC Form 1 for 2006, trade publications, other publicly available studies, and our knowledge of western energy markets.

A. Recommendations

We recommend that the Commission:

1. Accept APS' plan for acquiring non-distributed resources. The plan is generally reasonable as explained below, and APS has the institutional capability to acquire non-distributed renewable resources based upon its previous experience and its ongoing process for obtaining additional renewable energy.

2. Recognize that many non-distributed renewable resources are cost competitive with conventional generation.

In the following sections we provide detail supporting our recommendations.

B. Benefits of Non-Distributed Renewable Energy

Non-distributed renewable energy resources required by the RES, such as wind, geothermal, biomass, and concentrating solar power, provide several benefits to society, including:

- A hedge against high natural gas prices. Renewable resources displace marginal conventional generation – usually natural gas fired generation. Renewable resources typically exhibit fixed or stable prices while natural gas has unpredictable, volatile, and generally upward trending prices. Thus, fixed or stably priced renewable resources limit APS' exposure to high fossil fuel costs.
- Little or no emission of carbon dioxide or other air pollutants, in contrast to burning coal or natural gas to generate electricity.
- Minimal exposure to the costs of complying with future greenhouse gas emission regulations, in contrast to fossil fueled power plants.
- Opportunities for technological improvements and economies of scale resulting from increased deployment of renewable energy technologies.

C. Market Conditions

In preparing our review of APS' implementation plan, we took into account several market features as described below.

1. **APS' Experience.** APS has successfully contracted for 10 MW of geothermal resources and 90 MW of wind generation and is engaged in ongoing efforts to obtain additional renewable energy projects. Further, APS has installed various small photovoltaic and solar thermal projects.
2. **Resource Acquisition Risk.** Resource acquisition in general runs the risk that proposed projects might be cancelled or delayed or exhibit escalating costs. Industry experience with construction of conventional power plants in the 1970s and 80s provides numerous examples of such problems.¹ Renewable energy projects also experience cancellations, delays, and other impediments to meeting

¹ See, for example, United States General Accounting Office, *Electric Powerplant Cancellations and Delays*, EMD-81-25, December 8, 1980; and Thomas Lyon and John Mayo, "Regulatory Opportunism and Investment Behavior: Evidence from the U.S. Electric Utility Industry," *RAND Journal of Economics*, vol. 36, no. 3 (Autumn 2005): 628-644.

schedules and budgets.² APS is prudent to expect project failures and to manage this risk by contracting for more than the minimum resources to meet its RES requirements.³ In order to reduce the chances of selecting problematic renewable energy projects, utilities can use a variety of additional mitigation strategies, including:

- due diligence review of financial, performance, permitting, and other vulnerabilities of specific proposed projects
- performance guarantees
- pre-operation milestones
- pre-conditions such as creditworthiness conditions or equipment availability conditions

3. **Load Forecast Error.** Under-estimates of future load may result in a shortfall in meeting the RES kWh target for a particular year. APS' plan adopts a particular load forecast that may or may not be accurate. We have used our own projection of retail sales which is slightly higher than APS' forecast.
4. **Performance Risk.** Renewable resources, like conventional resources, may not perform as expected. We have assumed that existing projects will perform as they have already demonstrated in a period of normal operation and that other projects will perform as experience elsewhere indicates or as they are designed to perform.
5. **Fuel Price Forecast Error.** Under A.A.C. R14-2-1808 (B) (4), the costs of the RES are renewable resource costs over and above the market cost of comparable conventional generation. Thus, the market price of conventional energy and capacity must be projected for planning purposes. A large part of the market price of conventional energy is fuel costs. Natural gas prices have exhibited enormous volatility and a general upward trend; coal prices have gone up and down and are currently on an upward trajectory of unknown duration. Compounding the risk associated with price fluctuations is the inability to reliably project future fossil fuel prices. The Energy Information Administration conducted a review of its forecasts⁴ and found that, for long-term forecasts made from 1982 through 2006, the average absolute percent error (comparing forecasted prices and actual prices) for coal prices paid by electric generating plants was about 47% and for natural gas wellhead prices was about 64%. Based

² KEMA, Inc., *Building a "Margin of Safety" into Renewable Energy Procurements: A Review of Experience with Contract Failure*, prepared for the California Energy Commission, CEC-300-2006-004, January 2006.

³ APS RES Implementation Plan 2008 to 2012, Attachment A, pp. 3, 6-7.

⁴ Energy Information Administration, *Annual Energy Outlook Retrospective Review: Evaluation of Projections in Past Editions (1982-2006)*, Report DOE/EIA-0640(2006).

on this experience, we believe that any forecast of the market cost of comparable conventional generation should be regarded as unreliable.

D. Other Costs in APS' Implementation Plan

APS' plan indicates that non-distributed resources for both its green power program and the RES requirements will be obtained as a package. We incorporated APS' projected level of green power sales (plus losses) in calculating the amount of resources to be acquired for meeting the RES goals. In calculating the costs of meeting the RES goals, we excluded the costs of those portions of renewable resources devoted to serving green power customers.⁵

In addition, APS indicates that its plan includes administrative and implementation costs and costs of various studies to improve its understanding of market conditions and the integration of renewable resources into its system.⁶ We cannot determine whether the administrative and implementation costs are actually incremental costs. In general, we support the studies APS is conducting because they provide a far better basis on which to evaluate renewable resources than outdated and often erroneous assumptions used by some utilities. We assumed that incremental administrative, implementation, and study costs would be the values reported in APS' Exhibit 2, adjusted to remove a share of the costs attributable to green power service.

In preparing our analyses of non-distributed resources, we took into account transmission and distribution losses between the renewable energy delivery point to APS' system and customer load.⁷ Thus, our assumed renewable energy generation level and the associated costs include losses.

⁵ APS adjusted for costs associated with green power by subtracting green power revenues from the total budget.

⁶ APS RES Amended Implementation Plan 2008-2012, pp. 12-13, and Exhibit 2.

⁷ A.A.C. R14-2-1801 B states that the term "Annual Renewable Energy Requirement" means the portion of an Affected Utility's annual retail electricity sales that must come from Eligible Renewable Energy Resources. A.A.C. R14-2-1804 specifies the Annual Renewable Energy Requirement.

E. Projection of Resources

A.A.C. R14-2-1813 (B) (1) indicates that the kW and kWh of eligible renewable energy resources planned to be added by year for the next five years are to be identified by technology. APS' application is very general on this point. APS has several contracts for biomass projects with expected start dates in the next few years. APS is also engaged in acquiring additional resources but has not concluded specific agreements, so its plan presents two 90 MW wind resources as placeholders with one starting operation in 2009 and the other in 2012.

We assumed a mix of resources based on APS' implementation plan, APS' *Environmental Portfolio Standard Semiannual Report for July 2006 to December 2006*, and our knowledge of renewable energy markets in the Southwest (Figure 1).⁸ In particular, we assumed that the resources in 2008 are those in existence as of 2007 with no additional resources starting operation in 2008. New biomass resources that are already under development are assumed to start operation at the beginning of 2009,⁹ and 60 MW of new wind is assumed to start operation in 2009. We also assumed 49 MW of new geothermal resources would be added in 2010, paralleling a similar SRP contract.

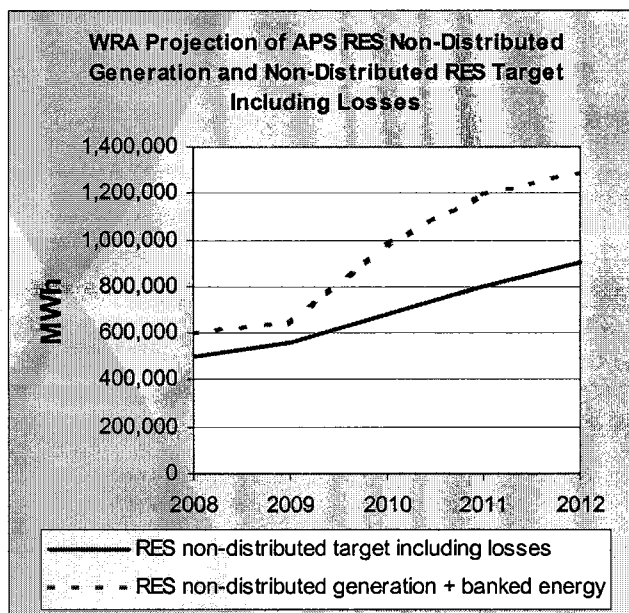
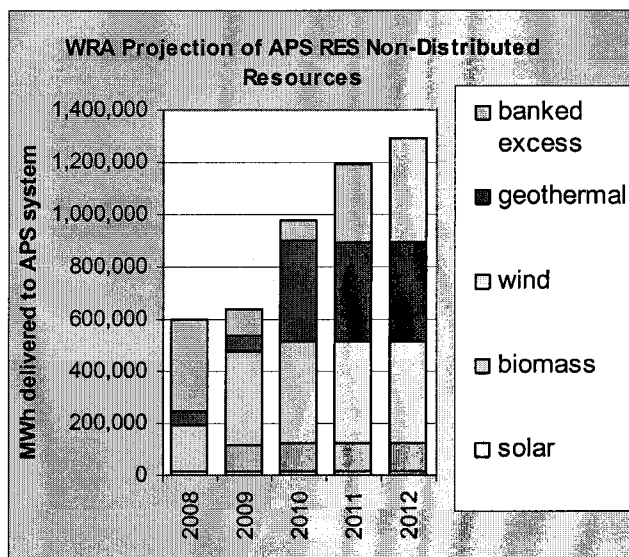


Figure 1 (top) and Figure 2 (bottom)

⁸ Portions of wind, geothermal, and new biomass resources that are assumed to serve green power customers are excluded from the chart. Because resources and green power sales vary over time, the amount of RES capacity and energy associated with some resources changes over time.

⁹ APS projected that the Snowflake White Mountain Power biomass facility would be on line in the third quarter of 2008 and that the 27th Avenue landfill gas project would be on line in the first half of 2009 (EPS Report filed March 1, 2007).

We assumed costs and capacity and energy levels for these new wind and geothermal resources based on similar projects in the southwest.

The mix of resources is probably adequate to meet APS' non-distributed RES requirements in each year (Figure 2),¹⁰ given our assumptions about retail sales, green power sales, the timing of new resource additions, and the generating capacity of new resource additions. Because of the lead times necessary for large new projects to come on line, a start date of early 2009 for a new wind project may be optimistic. APS will likely need to draw upon its banked excess MWh from previous years to meet the RES requirements in some years.

F. Non-Distributed Resource Costs

Figure 3 presents our projections of the costs of the non-distributed resources depicted in Figure 1, including administrative and study costs, and excluding green power program costs.¹¹ We conclude that non-distributed resources are likely to cost about the same as the market cost of comparable conventional generation (energy and capacity). Natural gas (the primary avoided fuel for conventional generation) is assumed to cost \$7.17 per MMBtu in 2007, escalating at a real rate of 2% per year (plus inflation).¹² In addition, we assumed that greenhouse gas emission regulations would take effect in 2012 and that

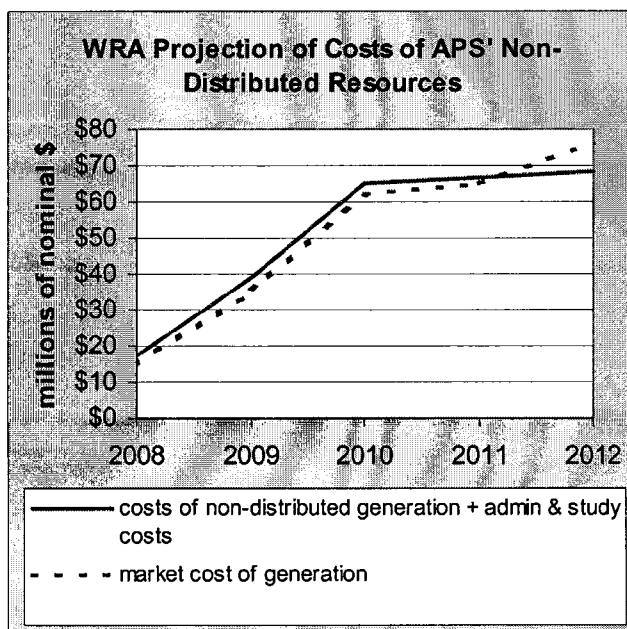


Figure 3

¹⁰ The chart excludes generation to serve green power customers.

¹¹ We assigned costs to the year in which the generation occurs, not the year the generation is used to satisfy the RES requirements. Thus, when banked energy is used to satisfy the RES requirements, its cost is zero because its costs were accounted for in the year the energy was generated.

¹² Gas price from Energy Information Administration, *Short-Term Energy Outlook*, September 2007, Table 4 for natural gas prices paid by the electric power sector for 2007. According to its FERC Form 1 for 2006, APS paid about \$8.32 per MMBtu in 2006. During the period 1992 to 2006, the real (constant dollar) rate of escalation of natural gas prices paid by the electric power sector was about 7%, far more than the escalation rate assumed here. We assumed that 80% of the energy from renewable resources would displace marginal natural gas fired generation and 20% of the renewable energy would displace marginal coal-fired generation. The average heat rate of marginal gas generation is assumed to be 7,900 Btu/kWh and the heat rate of marginal coal generation is assumed to be 10,470 Btu/kWh

the cost of allowances at that time would be \$17.91 per metric ton of carbon dioxide equivalent.¹³

To put the costs of the non-distributed renewable resources in perspective, we list below a comparison of our estimates of the costs of these resources and some financial indicators for APS from 2006.¹⁴

- Annual total cost (not above-market cost) of non-distributed renewable energy to meet RES requirements = \$17 to \$69 million, depending on the year (Figure 3)
- APS 2006 revenues from retail sales = \$2.51 billion
- APS 2006 fuel and purchased power costs for the regulated electricity market = \$966 million

G. Accounting for RES Costs

The implications of APS' approach to accounting for above-market RES costs in the RES adjustor or surcharge are unclear and we are seeking additional information. Major objectives are that the accounting method be practical for both APS and Staff, and that RES costs be accurately represented. APS' implementation plan (page 7) suggests that it would use projected above-market costs to set the RES adjustor or surcharge rate, even for historical years. An alternative approach would be to adjust the RES surcharge or adjustor balance annually by "back-casting" actual above-market costs. Back-casting could be accomplished by running APS' production cost model with and without RES resources, using actual fossil fuel prices, actual renewable energy prices, etc. Depending on any additional information we obtain, we may file comments on this accounting issue.

H. Conclusions

1. **Mix of resources.** APS did not offer a specific resource mix going forward because it had not yet concluded purchases of all those resources. APS' track record in acquiring renewable resources and its on-going resource acquisition processes are sufficient basis for accepting the general mix in APS' plan.
2. **Ability of plan to meet RES targets.** APS is likely to be able to meet the non-distributed renewable energy target in the planning period as long as it can add some large projects by early 2009.¹⁵

¹³ On August 17, 2007, the European Climate Exchange price of greenhouse gas emission allowances for December 2012 was 21.35 euros per metric ton, or about \$28.80 per metric ton.

¹⁴ APS financial data are from the Statistical Supplement to the Pinnacle West 2006 Annual Report.

¹⁵ If APS faces a shortfall in any year, it could limit participation in the green power program until more renewable energy is available, but this solution is not entirely satisfactory as it shortchanges green power customers.

3. **Cost of non-distributed resources.** Cost projections are tenuous given the uncertainties described above. In general, many non-distributed resources are competitive with conventional generation.
4. **Accounting for RES costs.** We continue to seek more information on the method of accounting for RES costs.

Respectfully submitted this 14th day of September, 2007.

by:

A handwritten signature in black ink, appearing to read 'DB', with a large loop and a trailing flourish.

David Berry
Senior Policy Advisor
Western Resource Advocates
P.O. Box 1064
Scottsdale, AZ 85252-1064

Amanda Ormond
Principal
The Ormond Group
7650 S. McClintock Drive
Suite 103-282
Tempe, AZ 85284
On Behalf of the Interwest Energy Alliance

Original and 13 copies mailed this 14th day of September 2007, to:

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Electronic copies to service list